1 of 3

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ON September 9, 2003

Mark B. Quatt Registration No. 30,484

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Paleari et al.
Serial No.: 09/807,210
Filing Date: July 16, 2001
Title: New High Resistance Heat-Shrinkable Thermoplastic Film

Docket No: 42992-01
Examiner: Patterson, Marc A.
Group Art Unit: 1772

BRIEF ON APPEAL

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

This Brief is being filed in triplicate in support of a Notice of Appeal filed May 8, 2003, in which the Applicants appealed from the rejection of claims 11 to 20 in the Final Office Action dated February 6, 2003.

The Commissioner is authorized to charge the fee of $320.00 for filing a Brief on Appeal, to Deposit Account No. 07-1765.

The Commissioner is authorized to charge any additional fees that may be required or credit any overpayment to Deposit Account No. 07-1765.

A Petition for a three (3) month extension of time is enclosed.

Respectfully submitted,

Mark B. Quatt
Attorney for Applicants
Registration No. 30,484
(864) 433-2817

Cryovac, Inc
PO Box 464
Duncan, SC 29334

9-9-03
date

Table of Contents

Real Party in Interest

The real party in interest in this patent application is Cryovac, Inc.

Related Appeals and Interferences

There are no other appeals or interferences known to Applicants, the Applicants' legal representative, or assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

<u>Status of Claims</u>

The claims now on Appeal are claims 11 to 20.

A copy of the claims presently on Appeal appears in the Appendix.

Status of Amendments

The claims now on Appeal are claims 11 to 20.

These are the same claims that were finally rejected in the Final Office Action dated February 6, 2003. No amendments after Final have been sought or entered.

A copy of the claims presently on Appeal appears in the Appendix.

Summary of the Invention

(References to the specification by page and line numbers are shown in parentheses.)

The packaging of food items by means of a heat-shrinkable, gas-barrier, thermoplastic film comprises configuring the heat-shrinkable packaging material, either partially or completely, around a product, removing excess air from inside the package, sealing it, and exposing the package to a heat source causing the film to shrink and conform to the contours of the packaged food (page 1, lines 7 to 12).

These films provide an attractive appearance and protect the packaged food from the environment, prolonging the shelf life of the packaged product (page 1, lines 13 to 15).

These films need to have good gas barrier properties, good sealing properties, high mechanical properties, and good optical and shrink properties. (page 1, lines 16 to 21).

A problem with such films is that it is generally necessary to carefully position the packages to be vacuumized and sealed, one close to another, in the vacuum chamber, so as to avoid any overlapping of the packages. When overlapped packages or partially overlapped packages are heat–sealed, either it is not possible to get a seal of sufficient seal strength between the innermost heat-sealing layers of each overlapped package, or, if the temperature and pressure of the sealing bars are high enough to guarantee sealing through the overlapped webs, sealing of the overlapped outermost layers may occur, thus leading to a high number of rejects (page 1, line 24 to page 2, line 3).

This also means that in the packaging process the speed of the overall process is limited by the number of packages that, at each sealing cycle, can be positioned, without overlapping, in the vacuum and sealing chamber (page 2, lines 3 to 6).

Using bags that can be suitably heat sealed also when overlapping occurs, without problems of insufficient seal strength and/or sealing or sticking of the outer abuse layers, a higher number of packages could be sealed in each sealing cycle with an increase in productivity. Also, the positioning of the packages in the vacuum and sealing chamber, one close to another with no overlapping, would not be a must thus rendering the presence of an operator dedicated to said positioning less critical (page 2, lines 7 to 12).

The inventors have found that this problem can be minimized by a multi-layer heat-shrinkable film comprising:

a) an outer heat-sealing layer comprising at least one polyolefin;

b) an outer abuse layer comprising a polyamide with a melting point of at least 175 °C; and

c) an intermediate gas barrier layer comprising vinylidene chloride copolymer;

wherein all the layers of the film are oriented.

(page 2, lines 20 to 24; page 3, lines 15 to 18; page 13, line 20 to page 14, line 3; page 13, lines 4-5; page 16, line 10; page 16, lines 27-28; page 17, lines 16-25; page 19, lines 17 – 24; page 22, lines 10 to 19).

Issues

The issues presented for review (per the Final Office Action, Paper #12, mailed December 3, 2002) are as follows:

1. Are claims 11 to 20 unpatentable under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention?

2. Are claims 11 to 13, and 16 to 20 unpatentable under 35 U.S.C. §102 (b) as being anticipated by Speer et al. (US 5,350,622)?

3. Are claims 14 and 15 unpatentable under §103(a) over Speer et al. (U.S. Patent No. 5,350, 622) in view of Arita et al. (US 4,652,490)?

Grouping of Claims

Under 37 CFR 1.192(c)(7), applicants state that the claims do not stand or fall together. For the purpose of this appeal, the claims are grouped as follows:

Group 1: Claims 11 to 13, 16 to 18, and 20.

Group 2: Claim 19.

Group 3: Claims 14 and 15.

Argument

Claims 11 to 20 are patentable under, and meet the requirements of 35 U.S.C. §112, first paragraph.

The Final Office Action points out that the phrase "wherein all of the layers of the film are oriented" does not appear in the specification. Applicants agree that this specific phrase does not appear in the specification. However, applicants take the position that (1) *ipsissimus verbis* support for a claim element is not necessary to meet the requirements of 35 U.S.C. §112, first paragraph, and that (2) the present specification contains support for the claimed element, in that it reasonably conveys to one skilled in the relevant art (in this case, the art of producing thermoplastic heat shrinkable films for packaging applications) that the inventors, at the time the application was filed (July 16, 2001), had possession of the claimed invention.

Applicants refer the Board to the following portions of the specification:

page 3, lines 15 to 18:

> that comprises (co)-extrusion of at least the first outer heat-sealing layer (a) and possibly of other but not all the layers of the overall structure in the desired sequence, to give a first extrudate; extrusion coating of the obtained first extrudate with the remaining layers of the overall structure in the desired sequence, to give a second extrudate; and ***orientation thereof***.

(emphasis added)

page 13, lines 4-5:

> While in a preferred embodiment of the present invention the film is biaxially oriented and will therefore be heat-shrinkable in both directions . . .

page 13, line 20 to page 14, line 3:

> According to said process, the multi-layer film is co-extruded through a round die to obtain a tube of molten polymer which is quenched immediately after extrusion without being expanded, then heated to a temperature which is above the T_g of all the resins employed and below the melting temperature of at least one of said resins, typically by passing it through a hot water bath, but alternatively using a hot air tunnel or an I.R. oven, and expanded, still at this temperature by internal air pressure to get the transversal orientation and by a differential speed of the pinch rolls which hold the thus obtained "trapped bubble" to provide the longitudinal orienta-

tion. The film is then rapidly cooled to somehow freeze the molecules of the film in their oriented state and wound.

page 16, line 10:

In some instances it may be desirable to submit ***the oriented structure*** to an annealing step . . .

(emphasis added)

Attention is also drawn to page 16, lines 27-28; page 17, lines 16-25; page 19, lines 17 – 24; and page 22, lines 10 to 19.

Applicants also note, as cited above, that the specification teaches that the films of the present invention can be manufactured by the trapped-bubble process. According to this process, the multi-layer film is co-extruded to obtain a tube of molten polymer which is quenched immediately after extrusion without being expanded, then heated to a temperature which is above the T_g of all the resins employed and below the melting temperature of at least one of said resins. Reviewing e.g. Example 1, starting on page 17 of the specification, whereever melting points are explicitly given for designated resins, they are greater the reheat temperature of 95 °C - 98 °C at which the extruded tube is oriented. Since the orientation of a layer occurs somewhere between the T_g and the melting temperature of the material, it is reasonable to conclude, even if the blended EVA resins of layers e), f) and g) had melting points lower than 95°C, that in at least some permutations of the examples, including Example 1, all the layers of the film will be oriented.

The Final Office Action, at page 5, states that:

The orientation of the film is discussed on page 17, but no broader language is used; the amendment therefore constitutes new matter.

Applicants agree that orientation of the film is discussed at page 17, but respectfully submit that none of the other occurrences of orientation (several discussed above) in the specification are addressed in the Office Action.

Applicants thus respectfully submit that read as a whole, the present specification reasonably conveys to the skilled artisan in the art of producing thermoplastic heat shrinkable films for packaging applications, that the inventors, at the time the application was filed, had possession of an invention in which all the layers are oriented.

Claims 11 to 20 are patentable under 35 U.S.C. §102 (b) over Speer et al. (US 5,350,622).

Speer et al. is directed to oxygen scavenging compositions that can be used in any type of flexible or rigid single or multilayer article. The only description of a heat-shrinkable film in Speer et al. is in column 11, lines 32-41, and in the structure there indicated, the abuse layer is uncrosslinked EVA, and not a polyamide, let alone a polyamide with a melting point of at least 175 °C. In the passage referred to in the Office Action, in column 12, lines 4 to 22, the manufacture of the same film is described even if generic terms are employed to indicate the layers, and in the next passage in column 12, at lines 23 to 27, it is reported that "[a] similar three-layered structure, absent any scavenger layer, is disclosed in US 4,278,738". This latter patent describes exactly the same structure: cross-linked EVA//PVDC/EVA.

It is certainly true that in column 12, lines 1 to 3, of Speer, it is indicated that "the abuse layer (c) may be polyethylene, EVA, cross-linkable polyolefins, ionomer or polyamide," but, first of all, it is not clear to what type of structures this statement should refer and, secondly, it is not specified that the polyamide has a melting point equal to or higher than 175°C, since the copolymers, such as nylon 6/12 and nylon 6/69, cited in the list of possible polyamides, can have melting points higher ***or lower*** than 175 °C, depending on their exact composition.

Also, if the outer abuse layer can be selected from a long list including polyamides, the barrier layer of Speer et al. can also be selected among a long list of possible oxygen barriers (see column 7, lines 31-38).

To get from Speer to the present invention, therefore, the person skilled in the art is required to make four different selections :

- the choice of a heat-shrinkable film (as opposed to the other films taught in Speer et al.),
- the choice of a vinylidene chloride copolymer barrier layer (as opposed to the many other oxygen barrier materials taught in Speer et al.),
- the choice of a polyamide as the outer layer, and
- once a polyamide is chosen for the outer layer, the choice of a polyamide with a melting point higher than 175°C.

This is the only combination that would provide the required balance of good properties, including good shrink properties, abuse resistance and stack sealability, discussed in the application. Speer et al. however do not describe this combination, and do not contain

any suggestion leading thereto as the closest structure in the examples is a structure with an uncross-linked EVA as the outer abuse resistant layer.

Group 2

2. Claim 19 is patentable under 35 U.S.C. §102 (b) over Speer et al. (US 5,350,622).

Applicants rely on the above comments with respect to Speer et al.

Applicants also point out that the Final Office Action does not point to any teaching in Speer et al. directed to a multi-layer heat-shrinkable film of claim 11 in the form of a **seamless tubing** wherein the outer heat-sealing layer is the innermost layer of the tube.

The Final Office Action, at page 6, in addressing this, states that:

> Applicant also argues, on page 6, that Speer et al. do not disclose tubing which is seamless. However, Speer et al. do not disclose a tubing having seams; the claimed aspect of the tubing being 'seamless' therefor reads on Speer et al.

Applicants respectfully disagree with this analysis, for two related reasons.

The first is that, because the reference does not shown a tubing having seams, it is assumed that Speer et al. must show a seamless tube. This reasoning by itself may have some validity if one is referencing the tubular coextrudate immediately after coextrusion. However, claim 19 does not refer to the annular tube extruded from the extrusion die. It refers instead to the multi-layer ***heat-shrinkable*** film of claim 11 in the form of a seamless tubing . . .

The heat shrinkability of the film is imparted, as disclosed in the application, only after extrusion, after quenching, after reheating, and after processing by e.g. the trapped bubble technique. Although the annular coextrudate may inevitably be "seamless", this is by no means the case for a heat shrinkable film. Many such films in the marketplace are in the form of layflat webs; many others are in the form of backseamed tubular casings; others in the form of end sealed or side sealed bags. None of these forms are "seamless" tubing.

Put differently, with respect to 35 USC 102(b) (the only substantive ground of rejection of claim 19 in the Final Office Action), Speer et al.'s *lack* of teaching of a tubing having seams can inevitably and inherently equate to a positive teaching of a seamless

tubing <u>only</u> with reference to the annular extrudate, and not with respect to a heat shrinkable film.

Group 3

Claims 14 and 15 are patentable under §103(a) over Speer et al. (U.S. Patent No. 5,350, 622) in view of Arita et al. (US 4,652,490).

Applicants rely on the above comments re: Speer et al.

Also, Arita et al. is directed to heat-shrinkable structures obtained by laminating together oriented heat-shrinkable layers. In Example 2, one surface of a heat-shrinkable nylon 6 film (nylon 6 has a very high melting point, well above the 175°C limit) is *coated* with PVDC and then this film is laminated, via a layer of LDPE extrusion coated on the PVDC surface, to a heat-shrinkable, oriented, LLDPE film. The film structures described in the present application are different from those described in Arita. The applicants extrude PVDC instead of making a coating thereof, and obtain the films as cast tapes and then orient them. Thus, all the layers are oriented, while in Example 2 of Arita the extrusion coated LDPE used as an adhesive is not oriented.

The teaching "blends of two or more foregoing polymers" in column 2, line 40 of Arita et al., refers to:

polyamides (not all with a melting point of at least 175°C),
polyesters,
vinyl chloride polymers,
acrylonitrile polymers,
styrene polymers,
olefin polymers,
polyvinyl alcohol, and
EVOH,

and the above quoted sentence is also followed by "and polymer mixtures containing one or more foregoing polymers as a main component" , thus covering almost any polymer or polymer blend known at least in the film area. In spite of said generic statement, the text does not contain any example of blends.

There are to be sure other patents, and commercial products, where blends of nylon and EVOH are specifically described for use in the *internal or core* layers in the manufacture of heat-shrinkable films, but the question to be answered here is for what purpose. Typically EVOH and nylon are blended to get an oxygen barrier layer that has

a higher oxygen transmission rate than pure EVOH. As an example, for packaging respiring products, such as cheese, blends of nylon and EVOH are very commonly employed as barrier layers. In applicants' invention, however, the oxygen barrier requirements are met by the PVDC barrier layer (also because it is widely known that the barrier properties of EVOH are negatively affected by humidity and therefore the use of this resin in an outer layer, in contact with the atmosphere, as the structure barrier layer is not recommended). The EVOH in our invention may be blended with the polyamide resin for the outer layer (and is preferably blended therein) to maintain and possibly improve the balance of good properties achieved with the specific combination of layers. Compare for instance the structures of examples 12 and 13 of the present application, that differ only in the presence of 30% of EVOH blended with the polyamide with a melting point equal to or higher than 175 °C in the outer abuse layer. The structure containing the EVOH/polyamide blend behaves essentially like the one with a pure polyamide layer as far as shrinkability, mechanical properties, and stack sealability are concerned and in some respects it gives even better results : an increase in the shrink properties (81% versus 72%), an increase in modulus (see Table 1), a slightly higher puncture resistance, a significantly lower number of rejects in the in-line abuse test (see Table 2), and a slightly lower SIT min. (see Table 3). No motivation has been articulated as to why the person skilled in the art would not have had to blend an EVOH (generally used for its oxygen barrier properties) to the suitably selected polyamide used in our structures for the ***outer*** layer.

Applicants respectfully ask the Board to reverse the finding of the Final Action, and to allow claims 11 to 20.

Appendix

What is claimed is:

11. A multi-layer heat-shrinkable film comprising:
    a) an outer heat-sealing layer comprising at least one polyolefin;
    b) an outer abuse layer comprising a polyamide with a melting point of at least 175 °C; and
    c) an intermediate gas barrier layer comprising vinylidene chloride copolymer; wherein all the layers of the film are oriented.

12. The multi-layer heat-shrinkable film of claim 11 wherein the polyamide of the outer abuse layer has a melting point of between 175 °C and 250°C.

13. The multi-layer heat-shrinkable film of claim 12 wherein the polyamide of the outer abuse layer is selected from the group consisting of:
    a) copolyamide 6/12,
    b) copolyamide 6/66,
    c) polyamide 6 copolymer comprising less than 5%, by weight of the copolymer, of an aromatic co-monomer,
    d) copolyamide of polyamide 6 and a partially aromatic polyamide, and
    e) terpolyamide comprising polyamide 6, polyamide 11, and polyamide 66.

14. The multi-layer heat-shrinkable film of claim 12 wherein the outer abuse layer comprises at least 50%, by weight of the outer abuse layer, of at least one polyamide with a melting point of at least 175 °C, blended with less than 50%, by weight of the outer abuse layer, of an ethylene-vinyl alcohol copolymer.

15. The multi-layer heat-shrinkable film of claim 14 wherein the ethylene-vinyl alcohol copolymer comprises between 3% and 40% by weight of the outer abuse layer.

16. The multi-layer heat-shrinkable film of claim 11 wherein the heat-sealing layer comprises a single polyolefin or a blend of two or more polyolefins with a melting temperature less than 140°C.

17. The multi-layer heat-shrinkable film of claim 16 wherein the heat-sealing layer comprises a material selected from the group consisting of:

a) heterogeneous or homogeneous ethylene-α-olefin copolymer having a density less than 0.915 g/cm^3,

b) a blend of a) with a minor amount of polyethylene homopolymer,

c) ethylene-vinyl acetate copolymer,

d) ethylene-acrylic or methacrylic acid copolymer,

e) ionomer,

f) a blend of heterogeneous or homogeneous ethylene-α-olefin copolymer having a density of between 0.915 g/cm^3 and 0.930 g/cm^3, and ethylene-vinyl-acetate copolymer or ethylene-alkyl (meth)acrylate copolymer,

g) ethylene-propylene-butene ter-polymer, and

h) ethylene-alkyl acrylate-maleic anhydride ter-polymers.

18. The multi-layer heat-shrinkable film of claim 17 wherein the heat-sealing layer (a) comprises a heterogeneous or homogeneous ethylene-α-olefin copolymer having a density less than or equal to 0.915 g/cm^3.

19. The multi-layer heat-shrinkable film of claim 11 in the form of a seamless tubing wherein the outer heat-sealing layer is the innermost layer of the tube.

20. A container comprising a multi-layer heat-shrinkable film comprising:

a) an outer heat-sealing layer comprising at least one polyolefin;

b) an outer abuse layer comprising a polyamide with a melting point of at least 175 °C; and

c) an intermediate gas barrier layer comprising vinylidene chloride copolymer, wherein the container includes a seal involving the outer heat-sealing layer, and wherein the outer heat-sealing layer forms the inside layer of the container, and the outer abuse layer forms the outside layer of the container.